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## ABOUT REACH

REACH PRINTERS ARE DESIGNED TO BE INEXPENSIVE, ADAPTABLE, AND UPGRADEABLE. ALL COMPONENTS OF THE PRINTER ARE EASILY REPLACED AS WELL AS ATTAINABLE. THE PRINTER DESIGN IS SIMPLISTIC YET STRONG, MAKING THE PRINTER EXTREMELY DURABLE. THE METAL STRUCTURE OF THE PRINTER NOT ONLY MAKES IT STURDY, BUT ALSO PARTICULARLY PRECISE. THE SIMPLISTIC DESIGN ALLOWS FOR A HIGH LEVEL OF CUSTOMIZATION FOR THOSE WHO LIKE TO MODIFY EXISTING DESIGNS TO FULFILL THEIR NEEDS.

## SAFETY PRECAUTIONS

BY ORDERING A REACH 3D PRINTER, YOU AGREE THAT YOU HAVE THE TECHNICAL SKILLS TO ASSEMBLE AND USE THE 3D PRINTER. YOUR RESULTS MAY VARY FROM OTHER USERS. REACH DOES NOT GUARANTEE THE TECHNICAL APTITUDE OF CUSTOMERS. REACH ADDITIONALLY DOES NOT GUARANTEE A MINIMUM QUALITY STANDARD PRODUCED BY KITS THAT ARE ASSEMBLED BY THE CUSTOMER. ASSEMBLY AND USE OF THE PRINTER IS POTENTIALLY HAZARDOUS. THE PROCESS OF ADDITIVE MANUFACTURING INCLUDES ELECTRICITY, HIGH TEMPERATURES, AS WELL AS MOVING PARTS, WHICH CAN CAUSE INJURY. THERE ARE OTHER INHERENT RISKS WHILE OPERATING THESE PRODUCTS, IF YOU ARE NOT COMFORTABLE USING THEM, DO NOT OPERATE THEM.

## DISCLAIMER

REACH 3D PRINTERS CANNOT BE HELD RESPONSIBLE FOR ANY DAMAGE, INJURY, LOSS, THREATS, OR OTHER NEGLIGENCE RESULTING FROM ASSEMBLY OR USE OF THE PRINTER AND IT'S PRODUCTS. BY OPERATING OUR PRODUCTS YOU AGREE TO OUR TERMS OF USE OUTLINED IN OUR WEBSITE, AS WELL AS ABSOLVING REACH OF ANY AND ALL LIABILITIES. WE DO NOT RECOMMEND LEAVING YOUR PRINTER UNATTENDED WHILE IN USE. AVOID ALL MOVING PARTS DURING OPERATION. JUST REMEMBER THIS IS NOT A TOY AND SHOULD BE TREATED WITH THE UTMOST RESPECT TO PREVENT INJURY. FOLLOW SAFETY PRECAUTIONS, USE COMMON SENSE AND PRINT AWAY!

# PARTS LIST

2

## METAL PLATES AND FRAME:

1x CARRIAGE PLATE  
1x X MOTOR PLATE  
1x GANTRY MAIN PLATE  
1x GANTRY SUPPORT PLATE  
1x SHORT X BEARING PLATE  
1x LONG X BEARING PLATE  
2x BED SUPPORT PLATE  
1x BED PLATE  
1x YZE MOTOR PLATE  
1x EXTRUDER PLATE  
1x TABLE SUPPORT PLATE

1x 293MM 2020 EXTRUSION  
1x 303MM 2020 EXTRUSION  
1x 248MM 2040 EXTRUSION  
1x 373MM 2040 EXTRUSION  
1x L RAIL  
1x L RAIL WITH EXTRA HOLE  
3x 90 DEG. BRACE W/NUBS  
1x 90 DEG. BRACE W/O NUBS

## PLASTIC PARTS:

2x HOT END CLAMP  
1x X BELT BLOCK  
1x PROXIMITY CLAMP  
1x FAN HOLDER  
1x X LIMIT HOLDER  
2x Z LEAD SCREW NUT CLAMP  
1x X LIMIT BRACE  
1x Y LIMIT HOLDER  
1x EXTRUDER BLOCK  
1x EXTRUDER SPACER  
1x EXTRUDER SMALL GEAR  
1x EXTRUDER LARGE GEAR  
1x EXTRUDER TENSION ARM  
1x EXTRUDER ARM COVER  
1x RAMPS HOLDER

## DRIVE SYSTEM:

12x DELRIN V WHEELS  
30x 625ZZ BEARINGS  
1x 8x300MM Z LEAD SCREW  
1x BRASS Z LEAD SCREW NUT  
1x 8x5 Z COUPLING  
2x GT2 20 TOOTH PULLEY  
1x GT2 800MM BELT  
1x GT2 500MM BELT  
1x Mk8 DRIVE GEAR

## ELECTRONICS:

1x RAMPS ARDUINO COMBO  
4x STEPPER DRIVERS  
1x 12V 175MM TERMINAL LEADS  
1x USB CABLE  
1x ALL METAL HOT END  
1x PROXIMITY SENSOR  
1x 40MM FAN  
1x X 1050MM LIMIT SWITCH  
1x Y 400MM LIMIT SWITCH  
1x JST 1050MM FAN EXTENSION  
4x NEMA 17 STEPPER MOTOR  
1x 1000MM MOTOR WIRES  
1x 350MM E MOTOR WIRES  
1x 250MM Z MOTOR WIRES  
1x 200MM Y MOTOR WIRES

## HARDWARE:

2x M5x60 BOLT  
1x M5x50 PT SILVER BOLT  
7x M5x35 BOLT  
1x M5x25 PT SILVER BOLT  
8x M5x25 BOLT  
28x M5x10 BOLT  
24x M5 NUT  
27x M5 T-NUT  
2x M5 T-NUT FLAT  
3x M3x50 BOLT  
3x M3x25 BOLT  
5x M3x20 BOLT  
10x M3x16 BOLT  
17x M3x8 BOLT  
21x M3 NUT

18x 1/4" SPACER  
54x 10x5x1 WASHERS  
2x #4 WOOD SCREW  
4x SMALL SPRINGS  
2x LARGE SPRING

## BASIC KIT:

1x 12V 6A POWER SUPPLY

## UPGRADE KIT:

1x 12V 10A POWER SUPPLY  
1x 12864 LCD SCREEN  
1x 6x400MM LOOM

## SPARE PARTS AND TOOLS:

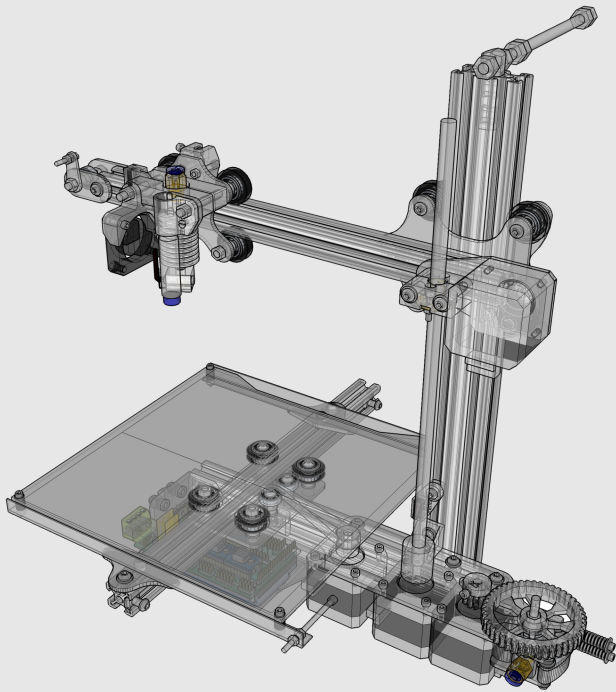
### ALLEN KEYS:

(3/2.5/2/1.5)

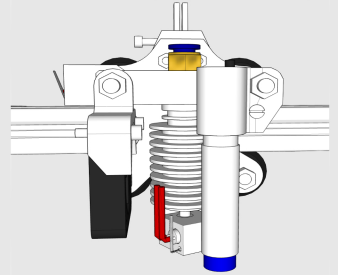
1x .4MM NOZZLE  
1x 6x26MM METAL BARRE  
1x STEPPER DRIVER  
15x JUMPERS  
1x V WHEEL  
2x 625ZZ BEARING  
2x M5x10 BOLT  
1x M5 NUT  
2x M5 T NUT  
1x M3 NUT  
4x 10x5x1 WASHERS



# REACH MAIN COMPONENTS

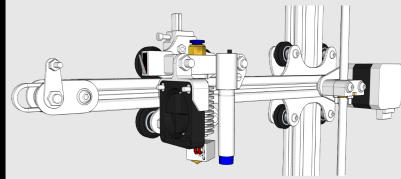


## CARRIAGE AND HOTEND



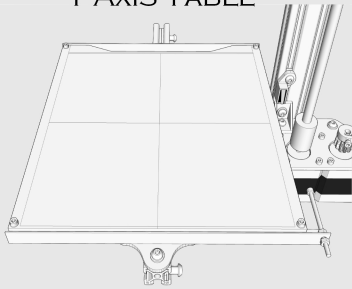
THE CARRIAGE HOLDS THE HOTEND OR OTHER TOOLS

## X AXIS GANTRY



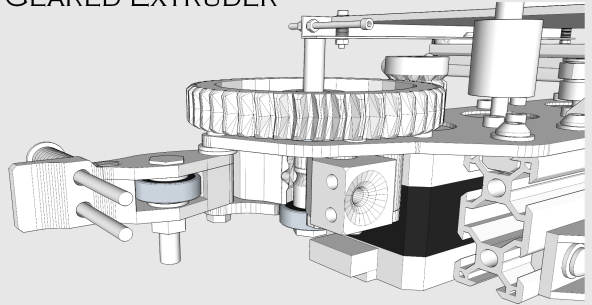
THE GANTRY MOVES THE CARRIAGE IN THE X AXIS

## Y AXIS TABLE



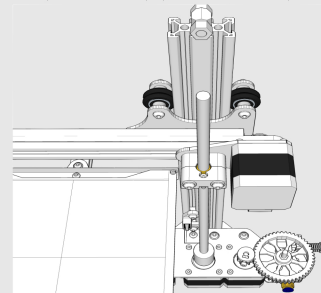
MOVES THE TABLE, OR BED PLATE IN THE Y AXIS

## GEARED EXTRUDER



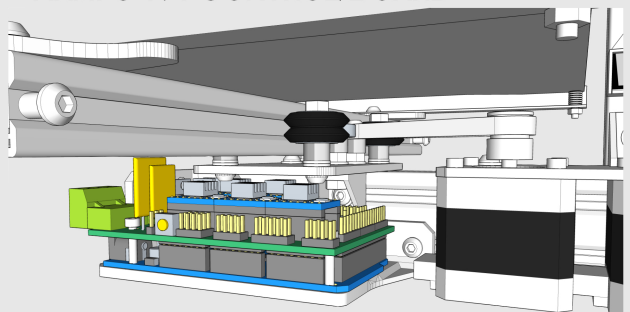
THE EXTRUDER SQUEEZES AND PUSHES FILAMENT INTO THE HOTEND.

## Z AXIS LEAD SCREW

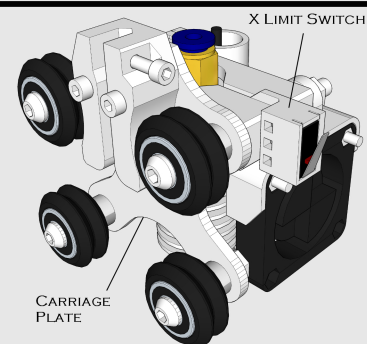
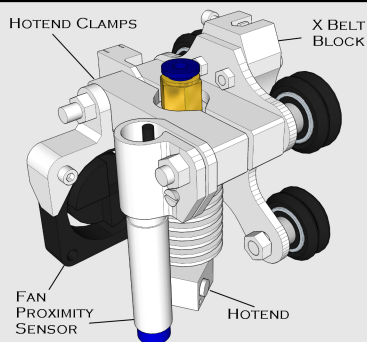


Z LEAD SCREW, LIFTS AND LOWERS THE GANTRY

## RAMPS 1.4 CONTROL BOARD



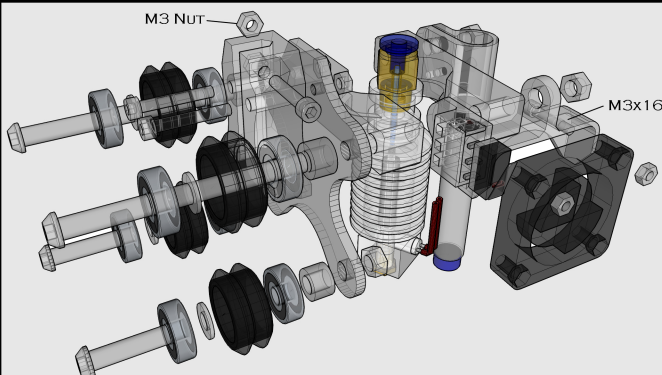
RAMPS BOARD CONTROLS THE STEPPER MOTORS AND HOTEND



## CARRIAGE ASSEMBLY STEPS:

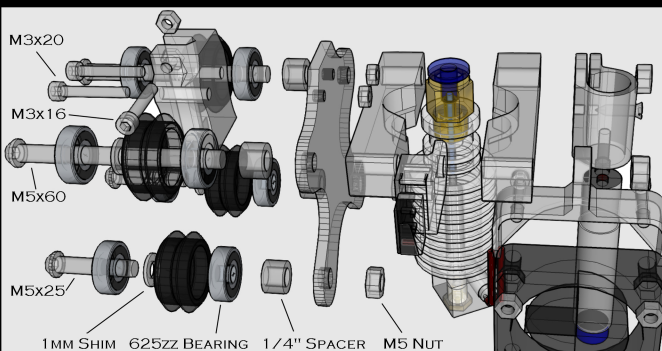
1. ASSEMBLE 4 V-WHEELS WITH 2 BEARINGS, SANDWICHING A WASHER BETWEEN.
2. SECURE BELT BLOCK TO CARRIAGE PLATE WITH M3X20 BOLTS AND M3 NUTS.
3. INSERT 2 M5X60 BOLTS THROUGH 2 WHEELS, THEN 1/4" SPACERS, THEN CARRIAGE PLATE, THEN CLAMP.
4. INSERT 2 M5X25 BOLTS THROUGH 2 WHEELS, THEN 1/4" SPACERS, THEN BOTTOM CARRIAGE PLATE, THREAD M5 NUT ON.
5. REMOVE BLACK CONNECTOR ON LIMIT SWITCH, FEED X LIMIT SWITCH WIRES THROUGH X LIMIT HOLDER, CAREFULLY PRESS IN PLACE, RECONNECT X LIMIT CONNECTOR.
6. PLACE HOTEND AND X LIMIT HOLDER IN INNER CLAMP, THEN PLACE OUTER CLAMP ON BOLTS.
7. FAN ASSEMBLY GOES ON LEFT BOLT, PROXIMITY ON RIGHT BOLT.
8. M3X16 BOLTS SECURE FAN TO FAN HOLDER, FEED PROXIMITY WIRES THROUGH PROXIMITY CLAMP FROM BELOW, SECURE SENSOR WITH WOOD SCREW.

NOTES: M3X16 BOLT AND M3 NUT SECURES 800MM BELT, (32 INCHES) IN BELT BLOCK, BELT ENDS EXTENDING 20MM OUT THE TOP, TEETH FACING IN.



1x CARRIAGE PLATE  
2x HOT END CLAMP  
1x X BELT BLOCK  
1x PROXIMITY CLAMP  
1x FAN HOLDER  
1x X LIMIT HOLDER

1x ALL METAL HOT END  
1x PROXIMITY SENSOR  
1x 40MM FAN  
1x X 1050 MM LIMIT SWITCH  
1x JST 1050 MM  
FAN EXTENSION



4x DELRIN V WHEELS  
8x 625ZZ BEARINGS  
4x 1/4" SPACER  
4x 10X5X1 WASHERS

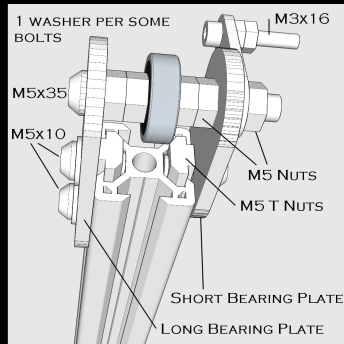
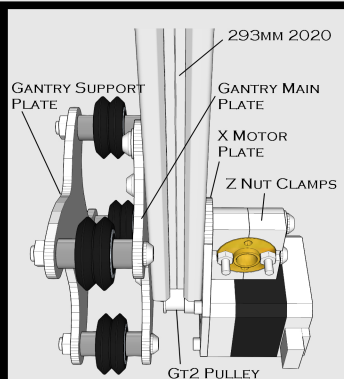
2x M5X60 BOLT  
2x M5X25 BOLT  
4x M5 NUT  
2x M3X20 BOLT  
3x M3X16 BOLT  
5x M3 NUT  
4x 1/4" SPACER  
4x 10X5X1 WASHERS  
1x #4 WOOD SCREW

V WHEEL ASSEMBLY: 625ZZ, 1MM WASHER, 625ZZ.

## GANTRY ASSEMBLY STEPS:

1. ATTACH GANTRY PLATE, FLAT PART TOWARD END OF SHORTER 293MM 2020 EXTRUSION USING 3 M5x10s, 3 WASHERS AND 3 M5 T NUTS.
2. ASSEMBLE V-WHEELS, 2 BEARINGS WITH 1 WASHER BETWEEN.
3. INSERT 4 M5x35 BOLTS THROUGH CORNERS OF GANTRY PLATE, THREAD FACING OUT. ADD 1/4" SPACERS TO BOLTS, THEN V-WHEELS, ANOTHER 1/4" SPACER, THEN GANTRY SUPPORT PLATE.
4. SECURE WHEELS, SPACERS AND PLATES WITH M5 NUTS.
5. PLACE GT2 PULLEY ON NEMA STEPPER MOTOR, THEN ATTACH MOTOR TO X MOTOR PLATE WITH M3x8 BOLTS, CONNECTOR FACING DOWN.
6. TAKE 2 M5x35 BOLTS, ADD A WASHER TO EACH, INSERT THROUGH Z NUT CLAMPS, THEN Z MOTOR PLATE, AND SECURE TO OPPOSITE SIDE OF 2020 WITH 2 M5 T NUTS.
7. SEND 2 M3x16 BOLTS DOWN THROUGH HOLES IN Z NUT CLAMPS. NOT USING M3 NUTS ALLOWS THE GANTRY TO SLIP OFF THE BRASS NUT FOR CRASH PREVENTION.
8. PLACE CARRIAGE ON GANTRY, WRAPPING BELT AROUND GT2 PULLEY FIRST, AND SLIDING WHEELS ON, KEEPING SLACK OUT OF BELT WITH FINGER.
9. ATTACH LONG X BEARING PLATE TO BACK OF 2020 WITH 2 M5x10 BOLTS, A WASHER AND T NUTS.
10. PUSH M5x35 BOLT THROUGH BACK OF LONG BEARING PLATE, ADD 2 M5 NUTS, A BEARING, THEN 2 MORE M5 NUTS.
11. ATTACH SHORT BEARING PLATE TO 2020 WITH M5x10 BOLT, WASHER AND T NUT.
12. USE M3x16 BOLT THROUGH X LIMIT BRACE, WITH 2 M3 NUTS. ATTACH X LIMIT BRACE TO M5x35 BOLT WITH M5 NUT.

NOTE: 800MM BELT SHOULD BE PULLED THROUGH THE RIGHT SIDE OF V-WHEELS, WRAPPED AROUND GT2 PULLEY. CARRIAGE SHOULD BE SLID ON FROM BELT BEARING SIDE OF GANTRY.



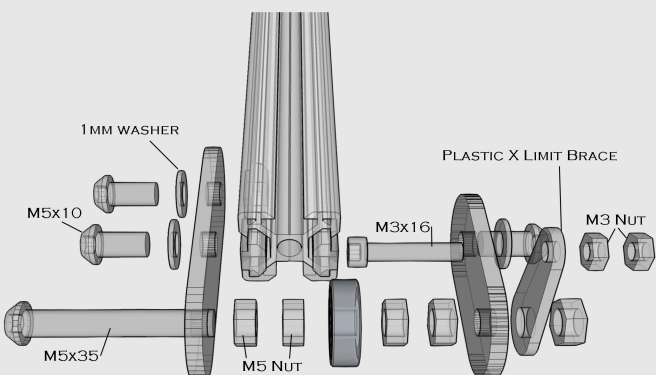
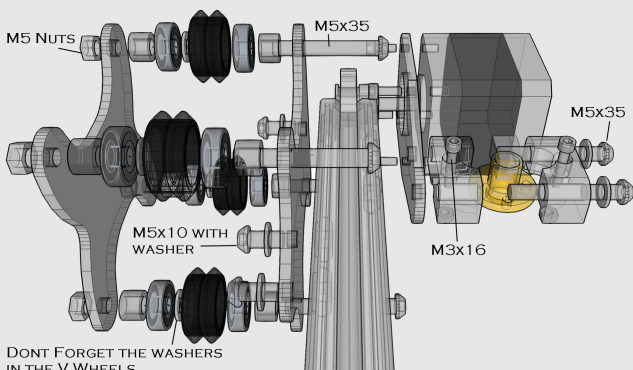
1x X MOTOR PLATE  
1x GANTRY MAIN PLATE  
1x GANTRY SUPPORT PLATE  
1x SHORT X BEARING PLATE  
1x LONG X BEARING PLATE  
1x 293MM 2020 EXTRUSION

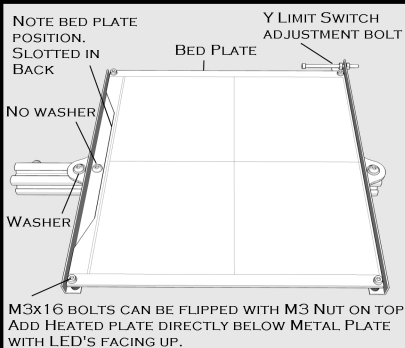
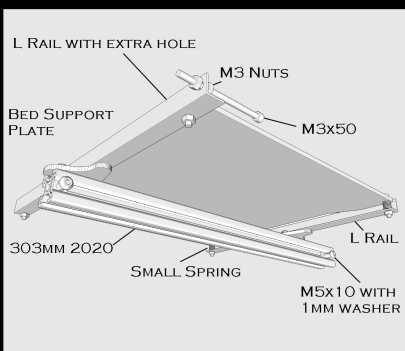
2x Z LEAD SCREW NUT CLAMP  
1x X LIMIT BRACE

1x NEMA 17 STEPPER MOTOR  
1x 1000MM MOTOR WIRES

1x BRASS Z LEAD SCREW NUT  
1x GT2 20 TOOTH PULLEY  
1x GT2 800MM BELT  
4x DELRIN V WHEELS  
9x 625ZZ BEARINGS

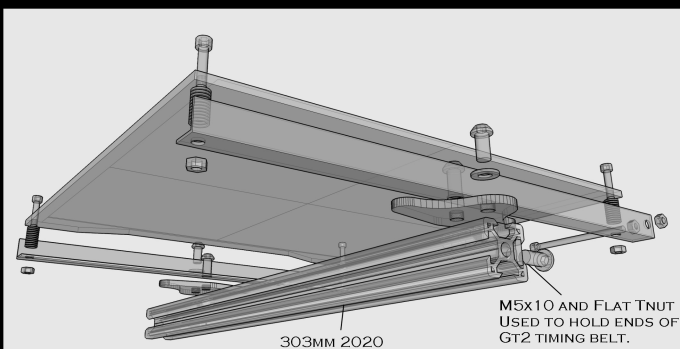
7x M5x35 BOLT  
6x M5x10 BOLT  
9x M5 NUT  
8x M5 T-NUT  
3x M3x16 BOLT  
4x M3x8 BOLT  
4x M3 NUT  
8x 1/4" SPACER  
12x 10x5x1 WASHERS





## TABLE ASSEMBLY STEPS:

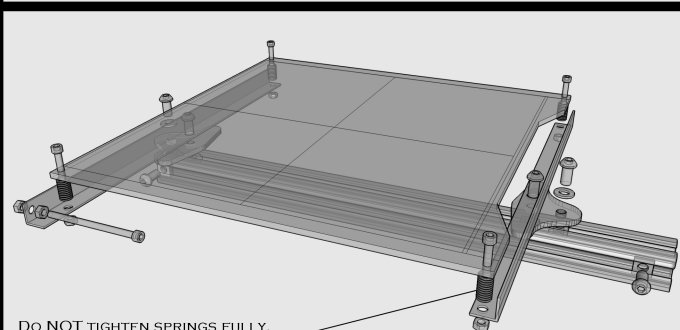
1. USING 1 M5x10 BOLT WITH WASHER AND M5 T NUT, ATTACH BED SUPPORT PLATES TO LONGER 303MM 2020 EXTRUSION.
2. SEND 1 M5x10 BOLT, NO WASHER, THROUGH CENTER OF L RAILS, THEN BED SUPPORT PLATE, TO M5 T NUTS.
3. PLACE M3x16 BOLTS INTO FRONT BED PLATE CORNERS. (ALSO THROUGH HEATED BED IF INCLUDED, SOLDER IN BACK, LEDs UP)
4. ADD SPRINGS TO BOLTS, THEN INTO L RAIL, THEN M3 NUT. (M3x16 BOLT CAN BE REVERSED, WITH M3 NUT ON TOP)
5. PLACE BACK BED M3x16 BOLTS THROUGH BED, ADD SPRINGS AT SAME TIME, THEN SECURE WITH NUTS THROUGH L RAIL.
6. USE M3x50 BOLT FOR Y ENDSTOP, USING 2 M3 NUTS THROUGH FRONT L RAIL.
7. USING M5x10 BOLTS AND FLAT T NUTS, PLACE BELT INTO SIDE SLOT OF 2020, AND SLIP FLAT T NUT WITH BOLT ON TOP OF BOLT.



2x BED SUPPORT PLATE  
1x BED PLATE  
1x 303MM 2020 EXTRUSION  
1x L RAIL  
1x L RAIL WITH EXTRA HOLE

1x GT2 500MM BELT

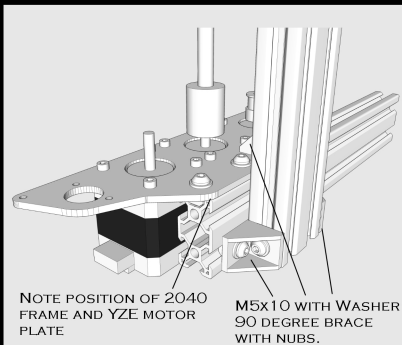
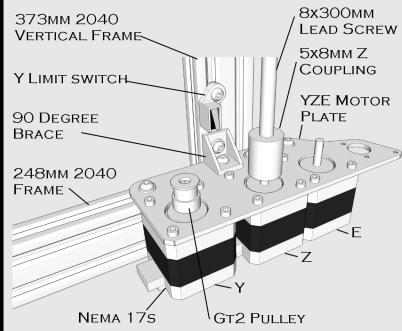
6x M5x10 BOLT  
4x M5 T-NUT  
2x M5 T-NUT FLAT  
1x M3x50 BOLT  
4x M3x16 BOLT  
6x M3 NUT  
2x 10x5x1 WASHERS  
4x SMALL SPRINGS



## YZE FRAME ASSEMBLY STEPS:

1. SEND Y LIMIT SWITCH WIRES THROUGH Y LIMIT HOLDER, THEN ADD BLACK CONNECTOR. (SET ASIDE)
2. USING M5x10 BOLTS, A WASHER AND T NUTS, ATTACH FLAT SIDE OF 90 DEGREE BRACES TO BOTTOM SIDES OF LONGEST 373MM 2040 EXTRUSION.
3. ATTACH BACK OF 248MM 2040 EXTRUSION TO BOTTOM OF LONGEST 2040 EXTRUSION, USING M5x10 BOLTS, WASHERS AND T NUTS THROUGH 90 DEGREE BRACES.
4. ATTACH YZE MOTOR PLATE TO TOP EDGE OF 248MM EXTRUSION, USING M5x10s, WASHERS AND T NUTS. USE 90 DEGREE BRACE TO ALIGN VERTICAL 2040.
5. PLACE X MOTOR WIRES, 4 HOT END WIRES, FAN EXTENSION WIRES AND X LIMIT SWITCH WIRES INTO TOP, FRONT SLOT OF 248MM 2040.
6. CONNECT Y, Z AND E MOTOR WIRES TO MOTORS, AND PLACE THEM AND Y LIMIT WIRE INTO LOWER, FRONT SLOT OF 248MM 2040. (LABEL BLACK CONNECTORS AS Y, Z AND E)
7. KEEPING WIRES IN SLOTS, CAREFULLY ATTACH MOTORS TO Y, Z AND E POSITIONS IN YZE MOTOR PLATE. (DONT PINCH WIRES!)
8. ATTACH Y LIMIT SWITCH HOLDER TO 373MM 2040 USING M5x10 BOLT AND T NUT. NO WASHER.
9. ATTACH 5x8MM Z COUPLING TO Z MIDDLE Z MOTOR, THEN ATTACH 8x300MM Z LEAD SCREW TO 5x8 COUPLING. (RUBBER BAND TO 2040)
10. ATTACH GT2 PULLEY TO Y MOTOR SHAFT.

NOTES: ON YZE PLATE 90 DEGREE BRACE, DO NOT USE A WASHER ON BOLT GOING DOWN, BUT DO USE A WASHER TO ATTACH TO 373MM 2040. ALSO, FEEDING WIRES INTO 2040 SLOTS CAN BE DIFFICULT TO NOT DAMAGE. YOU CAN SKIP HIDING WIRES IN FRAME, BUT PRINTER WILL HAVE WIRES EVERYWHERE!

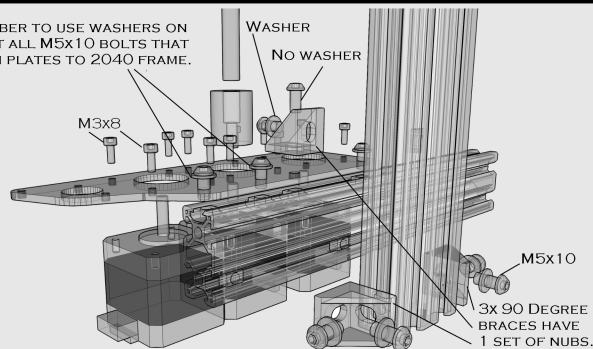


- 1x YZE MOTOR PLATE
- 1x 248MM 2040 EXTRUSION
- 1x 373MM 2040 EXTRUSION
- 3x 90 DEG. BRACE W/NUBS
- 1x Y LIMIT HOLDER
- 3x NEMA 17 STEPPER MOTOR
- 1x 350MM E MOTOR WIRES
- 1x 250MM Z MOTOR WIRES
- 1x 200MM Y MOTOR WIRES
- 1x Y 400MM LIMIT SWITCH

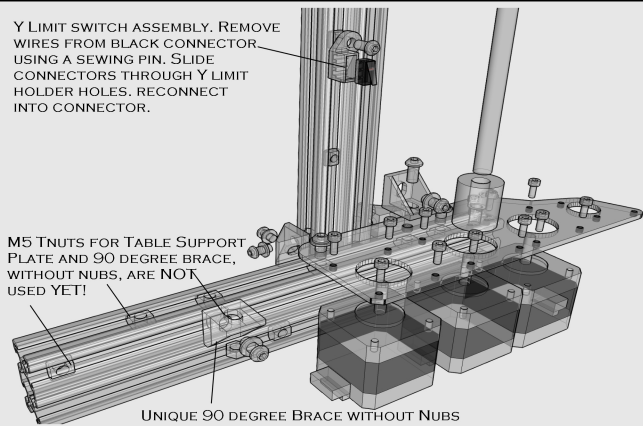
- 1x 8x300MM Z LEAD SCREW
- 1x 8x5 Z COUPLING
- 1x GT2 20 TOOTH PULLEY

- 10x M5x10 BOLT
- 10x M5 T-NUT
- 12x M3x8 BOLT
- 8x 10x5x1 WASHERS

REMEMBER TO USE WASHERS ON ALMOST ALL M5x10 BOLTS THAT ATTACH PLATES TO 2040 FRAME.



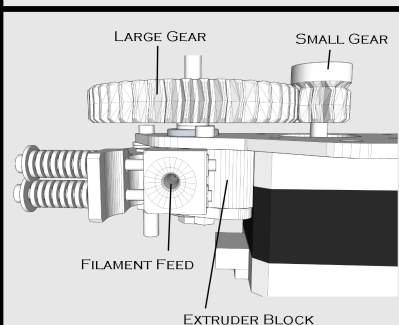
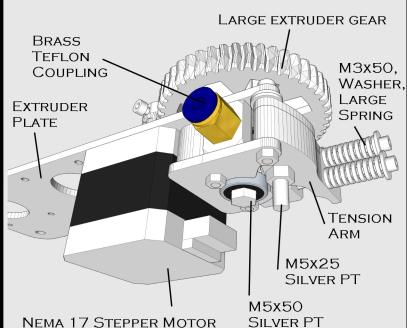
Y LIMIT SWITCH ASSEMBLY. REMOVE WIRES FROM BLACK CONNECTOR USING A SEWING PIN. SLIDE CONNECTORS THROUGH Y LIMIT HOLDER HOLES. RECONNECT INTO CONNECTOR.





# EXTRUDER ASSEMBLY

8



## EXTRUDER ASSEMBLY STEPS:

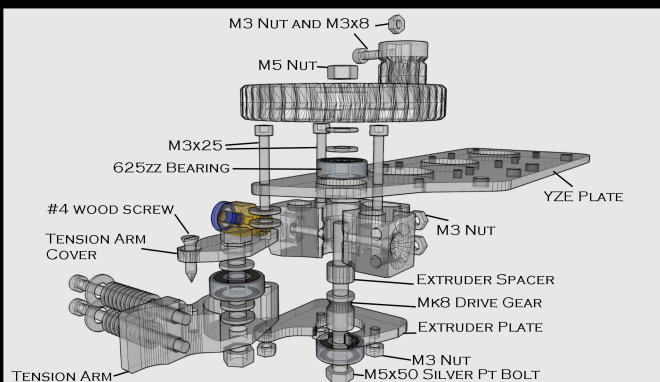
1. SEND SILVER, PARTIAL THREADED, M5x25 BOLT THROUGH TOP OF EXTRUDER ARM COVER. ADD WASHER, THEN BEARING, THEN 2 WASHERS, AND THREAD INTO EXTRUDER TENSION ARM.
2. TIGHTEN M5 NUT TO BOTTOM OF M5x25 BOLT, PULLING BOLT INTO RECESS OF ARM COVER. SCREW #4 WOOD SCREW THROUGH COVER INTO ARM.
3. PLACE 2 M3x25 BOLTS INTO YZE PLATE, ON SIDES OF BEARING HOLE. SLIDE EXTRUDER BLOCK UP ONTO BOLTS, THEN ADD EXTRUDER PLATE.
4. TIGHTEN EXT. PLATE WITH M3 NUTS, SANDWICHING BLOCK.
5. SEND M3x25 BOLT INTO CORNER OF YZE PLATE, DOWN THROUGH 1-2 WASHERS, THROUGH THE TENSION ARM, THROUGH WASHER, THROUGH PLATE, ADD M3 NUT.
6. SEND SILVER, PARTIAL THREADED, M5x50 BOLT THROUGH A BEARING, THEN Mk8 DRIVE GEAR. SECURE GEAR WITH SET SCREW.
7. ADD PLASTIC SPACER TO M5x50 BOLT, THEN INSERT BOLT FROM BELOW, INTO EXTRUDER PLATE. IT SHOULD SEAT TIGHTLY.
8. FROM THE TOP, DROP A BEARING ONTO M5x50 BOLT, THEN 2 WASHERS, THEN THREAD LARGE GEAR AND M5 NUT ONTO SILVER M5x50 BOLT. TIGHTEN.
9. PRESS M3 NUT INTO SMALL GEAR. THREAD M3x8 BOLT THROUGH M3 NUT IN SIDE OF THE SMALL GEAR.
10. PUT A WASHER AND LARGE SPRING ON EACH M3x50 BOLT. PLACE BOLTS THROUGH TENSION ARM HOLES, THROUGH BLOCK, INTO M3 NUTS.

NOTES: USE PLIER TO HOLD HEX HEAD OF M5x50 BOLT, WHILE YOU TURN LARGE GEAR TO SET M5 NUT INTO GEAR.

YOU DON'T HAVE TO USE WASHERS ON THE LARGE SPRINGS.

TENSION ARM BEARING SHOULD LINE UP WITH Mk8 GEAR TEETH.

GENTLY THREAD BRASS COUPLING INTO BLOCK, ONLY AFTER BLOCK IS SANDWICHED WITH ALUMINUM PLATES. (DONT OVER TIGHTEN!)



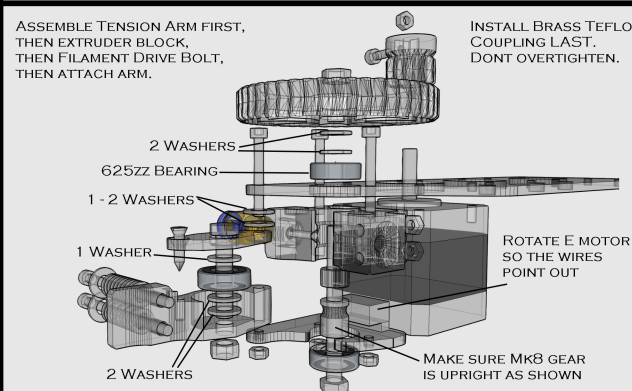
1x EXTRUDER PLATE

1x EXTRUDER BLOCK  
1x EXTRUDER SPACER  
1x EXTRUDER SMALL GEAR  
1x EXTRUDER LARGE GEAR  
1x EXTRUDER TENSION ARM  
1x EXTRUDER ARM COVER

1x Mk8 DRIVE GEAR  
3x 625ZZ BEARING

ASSEMBLE TENSION ARM FIRST, THEN EXTRUDER BLOCK, THEN FILAMENT DRIVE BOLT, THEN ATTACH ARM.

INSTALL BRASS TEFLON COUPLING LAST. DONT OVERTIGHTEN.



1x M5x50 PT SILVER BOLT  
1x M5x25 PT SILVER BOLT  
2x M5 NUT  
2x M3x50 BOLT  
3x M3x25 BOLT  
1x M3x8 BOLT  
6x M3 NUT  
10x 10x5x1 WASHER  
2x LARGE SPRING  
1x #4 WOOD SCREW

# 9 TABLE SUPPORT ASSEMBLY

## TABLE SUPPORT ASSEMBLY STEPS:

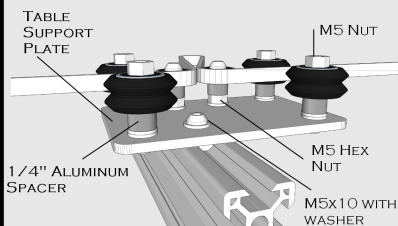
1. PLACE 2 T NUTS INTO TOP 248MM 2040 AND 1 T NUT IN FRONT TOP SLOT.
2. ASSEMBLE V-WHEELS WITH 2 BEARINGS AND A WASHER AS BEFORE.
3. MAKE SURE TABLE SUPPORT PLATE IS PROPERLY ORIENTED, 4 HOLES ON RIGHT, 3 HOLES ON LEFT.
4. SEND 4 M5x25 BOLTS UP THROUGH PLATE CORNERS, ADD 2 WASHERS, THEN 1/4" SPACER, THEN V-WHEELS, THEN TIGHTEN WITH M5 NUT.
5. MAKE 2 BELT GUIDES FOR MIDDLE RIGHT HOLES, USING AN M5x25 BOLT THROUGH A BEARING, THEN 1/4" SPACER, THEN TIGHTEN ON AN M5 NUT.
6. ADD WASHERS TO BELT GUIDE BOLTS, PLACE 1 THROUGH RIGHT FRONT PLATE HOLE AND ATTACH 90 DEGREE BRACE TO BOTTOM OF PLATE WITH M5 NUT.
7. SEND SECOND BELT GUIDE BOLT WITH WASHER, THROUGH RIGHT BACK PLATE HOLE, AND ATTACH PLATE TO 248MM 2040 WITH T NUT.
8. USING M5x10 BOLT, WITH WASHER, SEND THROUGH BACK LEFT PLATE HOLE INTO T NUT.
9. ANOTHER M5x10 BOLT AND WASHER GOES THROUGH 90 DEGREE BRACE, INTO T NUT ON TOP FRONT SLOT OF 248MM 2040.

NOTES: SPEND SOME TIME, ENSURING THE 90 DEGREE BRACE IS SQUARE AND TIGHT TO THE 248MM 2040 AND THE TABLE SUPPORT PLATE.

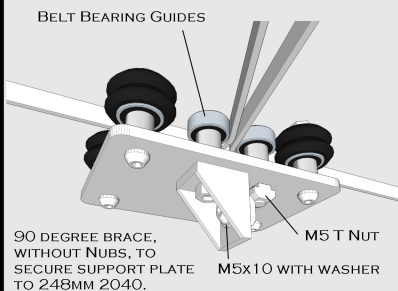
MAKE SURE THERE ARE NO GAPS IN THE 90 BRACE. YOU MAY HAVE TO LOOSEN THE 4 BOLTS AND SLOWLY TIGHTEN THEM UNTIL 90 BRACE IS TIGHT.

DONT FORGET TO MAKE SURE YOU HAVE ALL WASHERS CORRECT. EACH WASHER IN THIS ASSEMBLY IS CRITICAL!

## V-WHEEL, SERPENTINE BELT.



CAREFULLY NOTE 1/4" SPACER, M5 NUT, AND WASHER COUNTS.

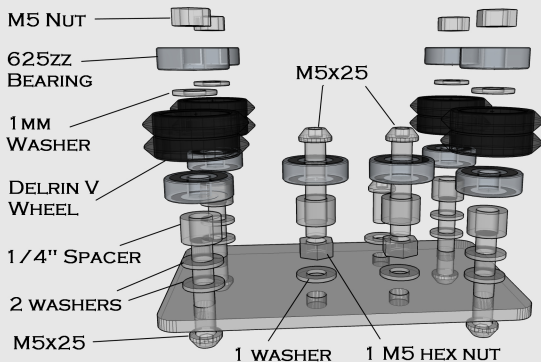
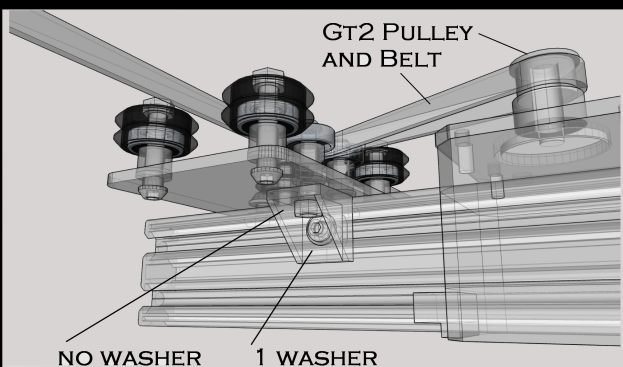


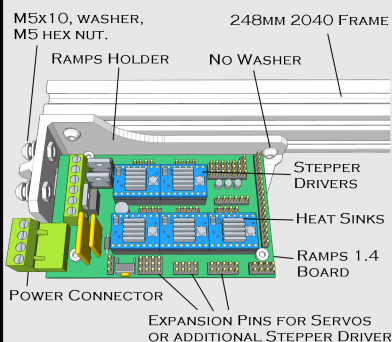
MAKE SURE THE 90 DEGREE BRACE IS TIGHT AGAINST THE FRAME AND TABLE SUPPORT PLATE. LOOSEN AND TIGHTEN UNTIL NO GAP.

1x TABLE SUPPORT PLATE  
1x 90 DEG. BRACE W/O NUBS

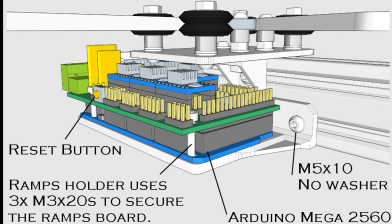
4x DELRIN V WHEEL  
10x 625ZZ BEARING

6x M5x25 BOLT  
2x M5x10 BOLT  
7x M5 NUT  
3x M5 T NUTS  
6x 1/4" SPACER  
16x 10x5x1 WASHERS





MAKE SURE YOUR 1/4" SPACERS, M5 HEX NUTS AND 1MM WASHERS ARE CORRECT



THE ARDUINO MEGA, IS THE BRAINS OF THE OPERATION. THIS MICRO CONTROLLER IS EXTREMELY VERSATILE, AND CAN BE PROGRAMMED TO DO ALMOST ANYTHING.

## ELECTRONICS ASSEMBLY STEPS

1. USING 3 M3x20 BOLTS, ATTACH RAMPS/ARDUINO COMBO TO RAMPS HOLDER.
2. ADD A WASHER TO 2 M5x10 BOLTS, SEND THROUGH LEFT SIDE OF RAMPS HOLDER, INTO M5 NUTS. THESE ARE YOUR 12V TERMINALS.
3. USE 2 M5x10 BOLTS, NO WASHERS, TO ATTACH RAMPS UNDER THE TABLE SUPPORT PLATE, TO 2040, WITH T NUTS AFTER ALL WIRING IS DONE.
4. ATTACH THE LCD SCREEN LAST, AS YOU CAN NOT SLIDE THE RAMPS HOLDER OUT SIDWAYS AND DOWN, WITH IT ATTACHED.
5. ROUTE PROXIMITY SENSOR WIRES THROUGH LARGE CENTER HOLE OF 248MM 2040, FROM EXTRUDER TO RAMPS.

NOTES: TO WORK ON RAMPS WIRING, JUST LOOSEN THE M5x10 RAMPS HOLDER BOLTS, AND SLIDE THE FIRST T NUT OUT, THEN ROTATE RAMPS HOLDER DOWN.

WIRING - WHEN VIEWING RAMPS BOARD FROM SIDE WITH RESET BUTTON:

GREEN POWER CONNECTOR, TOP TO BOTTOM IS (+, -, +, -).

TOP GREEN POWER CONNECTOR PAIR IS HEATED BED ONLY, BOTTOM PAIR IS EVERYTHING ELSE!

TOP 6 TERMINAL SCREWS, ARE (-, +, -, +, -, +) GOING DOWN. TOP PAIR IS EXTRUDER, THEN FAN, THEN BED.

12V TERMINAL SUPPLY PINS ARE BETWEEN YELLOW FUSES, AND X STEPPER DRIVER. TOP PIN IS (+), BOTTOM PIN IS (-).

BOTTOM XYZ STEPPER MOTOR DRIVERS ARE: LEFT IS X, MIDDLE IS Y, RIGHT IS Z.

TOP EXTRUDER STEPPER MOTOR DRIVERS ARE: LEFT IS E0, RIGHT IS E1.

6 THERMISTOR PINS ARE ABOVE Z MOTOR PINS, LEFT PINS ARE EXTRUDER 0, MIDDLE PINS ARE BED, RIGHT PINS ARE EXTRUDER 1.

LIMIT SWITCHES INPUTS ARE THE 3x6 GRID OF PINS. THEY ARE ARRANGED IN VERTICAL COLUMNS, 3 PINS PER SWITCH, 6 SWITCHES.

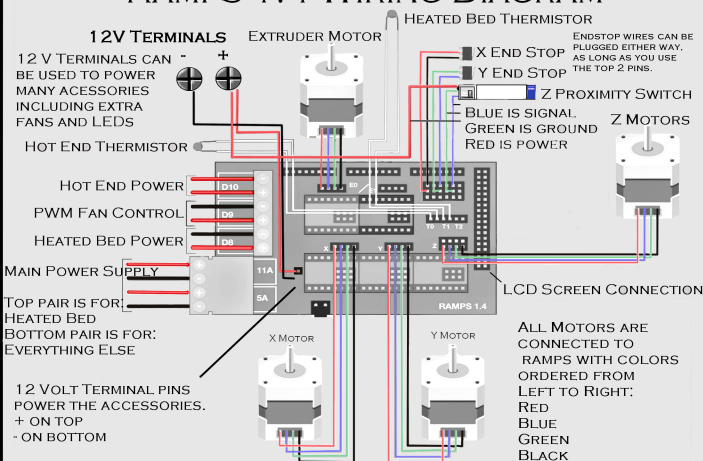
LEFT TO RIGHT, THEY ARE (X MIN, X MAX, Y MIN, Y MAX, Z MIN, Z MAX) SWITCHES USE TOP 2 PINS ONLY, TOP AND MIDDLE.

PROXIMITY SENSOR USES BLUE WIRE FOR SIGNAL, GREEN FOR GROUND. TOP PINS ARE SIGNAL. LAST BROWN WIRE IS TO POSITIVE 12V TERMINAL.

LCD SCREEN CONNECTION IS THE ROW OF PINS ON THE FAR RIGHT, AND BOTTOM RIGHT.

THE GRIDS OF PINS ON THE BOTTOM ARE USED FOR EXPANDING ANOTHER STEPPER DRIVER, OR USING SERVOS FOR PROBES AND BED TRAMMING.

## RAMPS 1.4 WIRING DIAGRAM



1x RAMPS HOLDER

1x RAMPS ARDUINO COMBO

4x STEPPER DRIVERS

1x 12V TERMINAL LEADS

1x USB CABLE

4x M5x10 BOLT

2x M5 NUT

2x M5 T NUTS

3x M3x20 BOLT

2x 10x5x1 WASHERS

## WARNING:

DO NOT POWER UP THE RAMPS BOARD WITH MOTORS DISCONNECTED. THE STEPPER DRIVER CHIPS CAN BURN UP. IF INSTALLING THE SECOND STEPPER DRIVER CHIP, BE SURE TO INSTALL IT WITH THE POTENTIOMETER SCREW FACING RIGHT.

NEVER LEAVE YOUR PRINTER UNATTENDED.

IF SOMETHING GOES WRONG, SIMPLY UNPLUG PRINTER.

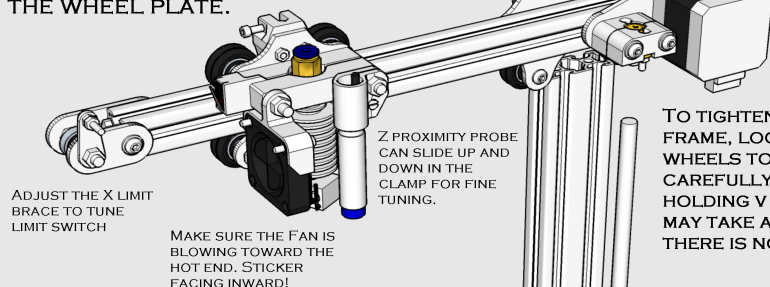


FRAME ALIGNMENT SHOULD BE DONE WITH A SQUARE. ENSURE VERTICAL COLUMN AND BASE FRAME 2020S ARE SQUARE TO EACH OTHER.

THE GANTRY SHOULD BE LEVEL TO THE BASE FRAME. 3 BOLTS SECURE THE GANTRY 2020 TO THE WHEEL PLATE.

ADJUST NUTS ON SPOOL HOLDER TO GUIDE UNIQUE SPOOL WIDTHS.

WHEN SETTING GANTRY ONTO VERTICAL FRAME, START WITH V-WHEELS, THEN LEAD SCREW, THEN V-WHEELS, GUIDING THEM SLOWLY TO PREVENT DAMAGE.



SECURE BELT TO FRONT SIDE OF BED 2020. PULL BELT STRAIGHT ALONG INSIDE OF 2020. SLIDE 2020 INTO FRONT V WHEELS WITH BELT. PULL BELT AROUND BEARING GUIDE, AROUND GT2 PULLEY, BACK AROUND SECOND BEARING GUIDE, AND BACK INTO SIDE OF 2020, THEN PUSH BELT AND 2020 THROUGH THE SECOND SET OF V WHEELS. USE FLAT T NUT AND M5X10 TO SECURE BELT TO END OF 2020.

MAKE SURE THE Y BELT BEARING GUIDES ARE TIGHT, SO THE BELT RIDES STRAIGHT IN THE V SLOT 2020.

12V TERMINALS CAN POWER MANY ACCESSORIES. I RECOMMEND RUNNING THE COOLING FAN FOR THE HOT END ON THEM, SO THERES NO CHANCE OF HEAT BUILDING UP IF THE FAN IS OFF. TWISTED TO THE 12V TERMINAL LEADS, WILL ENSURE TERMINAL BOLTS HAVE A SOLID CONNECTION.

ADJUST THE Y LIMIT SWITCH TO CONTACT THE M3X50 BED BOLT.

TO TIGHTEN V WHEELS TO 2020 FRAME, LOOSEN M5 NUT, SQUEEZE WHEELS TOGETHER ON FRAME, AND CAREFULLY RETIGHTEN WHILE STILL HOLDING V WHEELS TOGETHER. IT MAY TAKE A FEW TRIES. MAKE SURE THERE IS NO PLAY IN THEM.

LOOM ALL HOT END WIRES TOGETHER. MAKE SURE THE X AXIS MOTOR WIRES ENTER THE LOOM 250MM FROM THE EXTRUDER TO ALLOW PLENTY OF SLACK.

FILAMENT IS INSERTED FROM SPOOL, INTO BACK OF EXTRUDER BLOCK.

MANUALLY ROTATE LARGE GEAR TO TEST HOTEND FLOW.

TEFLON TUBE CHANNELS FILAMENT TO THE HOT END.

THE SURFACE OF THE BED SHOULD BE COVERED WITH BLUE PAINTERS TAPE OR BUILDTAK FOR BEST ADHESION RESULTS. THE FIRST LAYER IS CRITICAL.

THE ELECTRONICS SHOULD BE WIRED SO THAT NO MOVING PARTS CAN CRUSH OR CATCH IN THE TABLE OR GANTRY. MAKE SURE ALL WIRING, LIKE THE BED AND PROXIMITY WIRES ARE SECURED IN A WAY THAT CONNECTIONS DON'T EXPERIENCE STRESS. ALSO ENSURE THAT NO EXPOSED WIRING COMES IN CONTACT WITH METAL PARTS ON THE FRAME.

THE POWER SUPPLIES SHOULD BE PLACED IN A VENTILATED AREA, TO PREVENT OVERHEATING. IF THEY OVERHEAT, THEY WILL MOMENTARILY SWITCH OFF, STOPPING THE PRINT IN ITS TRACKS! PUSHING THE HEATED BED TEMP OVER 90C HAS PROVEN TO CAUSE THESE POWER SUPPLIES TO OVERHEAT.

UPGRADE KITS HAVE A HEATED BED THAT IS ATTACHED DIRECTLY UNDER THE BED PLATE. THERMISTOR WIRES ARE PLUGGED INTO THE BLACK CONNECTOR ALONG SIDE WITH THE HOT END WIRES.

## BED LEVELING

NOW GO TO THE MANUAL CONTROL TAB, AND CLICK THE "DISABLE MOTORS ICON, JUST ABOVE THE FEEDRATE SLIDER BAR.

THIS WILL DISENGAGE YOUR MOTORS IF THEY ARE ON. AT THIS POINT, USE YOUR HAND TO MOVE THE PRINTER HEAD TO THE FAR LEFT OF THE CANTILEVER SUPPORT.

ALSO MOVE THE TABLE TO THE MOST BACK POSITION.

THE Z AXIS IS A BIT MORE TRICKY TO PROPERLY HOME. IT REQUIRES THE ENDSTOP TO BE IN THE CORRECT POSITION IN RELATION TO THE HEIGHT OF THE BED. THE BED ALSO MUST BE LEVEL.

START BY ADJUSTING THE 4 BED SCREWS TO A SIMILAR LEVEL IN RELATION TO THE BED RAILS.

NEXT, BRING YOUR PRINTER HEAD DOWN TO A FEW MM FROM THE BED SURFACE. THEN, SLOWLY SLIDE THE PRINTER HEAD FROM SIDE TO SIDE, ENSURING IT REMAINS THE SAME HEIGHT ACROSS THE TOP OF THE ALUMINUM BED, ADJUST THE CORNER BED SCREWS AS NEEDED TO MAKE THE BED LEVEL.

ALSO, SLOWLY SLIDE THE TABLE TO AND FROM YOU, CHECKING HOW FAR THE BED NEEDS RAISED OR LOWERED TO STAY EVEN WITH THE PRINTER HEAD.

FINALLY ENSURE ALL CORNERS ARE AS EVEN AS YOU CAN MAKE THEM, MOVING THE BED AND PRINTER HEAD BY HAND, ADJUSTING THE CORNER SCREWS.

WHEN YOU'RE SATISFIED WITH THE LEVELNESS OF THE BED TO THE PRINTER HEAD NOZZLE, ADJUST YOUR Z ENDSTOP SO THAT IT CLICKS WHEN THE NOZZLE IS JUST A NOTE CARD THICKNESS AWAY FROM THE BED. SLIDE CARD STOCK BETWEEN THE TWO, FEELING FOR A VERY SLIGHT GRAB.

WHEN YOU'RE DONE, YOU HAVE FINALLY CALIBRATED THE PRINTER. THIS DOES NOT HAVE TO BE DONE VERY OFTEN. A SLIGHT ADJUSTMENT ON THE CORNER SCREWS EVERY ONCE IN A WHILE SHOULD KEEP IT CALIBRATED.

## BED SURFACE

THERE ARE A FEW WAYS TO PREPARE THE PRINT SURFACE.

THE EASIEST IS WITH BLUE PAINTERS TAPE. IT WORKS GREAT, HAS GOOD ADHESION TO THE PLA, BUT CAN BE TOUGH TO REMOVE.

ANOTHER METHOD IS WITH A PURPLE ELMERS GLUE STICK. SPREAD SOME ON, AND USE SOME WATER AND A PAPER TOWEL TO EVEN IT OUT.

ALSO, SOME FRIENDS AT ARCH REACTOR IN ST. LOUIS RECOMMENDED USING WHITE ELMERS GLUE.

## LOAD FILAMENT

WITH THE SPOOL ON A SPOOL HOLDER, TAKE THE PLA AND CUT THE END TO POINT. NOW SKIP THE EXTRUDER AND FEED THE PLA INTO THE BOWDEN TUBE, GOING ALL THE WAY TO THE HOT END, UNTIL YOU FEEL IT STOP. ENSURE IT IS ALL THE WAY FED. THEN OPEN THE FILAMENT TENSIONER ARM, AND PLACE THE PLA FILAMENT IN BETWEEN THE BEARING AND THE TOOTHED MK7 GEAR.

WE HIGHLY RECOMMEND USING WINDOWS 7 OR NEWER WITH OUR SUGGESTED SOFTWARE, REPETIER HOST. NETBOOKS ARE UNDERPOWERED AND MAY NOT RUN ANY RECOMMENDED SOFTWARE IN A SATISFACTORY MANNER. THERE ARE OLDER VERSIONS OF REPETIER THAT MAY WORK BETTER ON OLDER OR UNDERPOWERED COMPUTERS.

DOWNLOAD AND INSTALL:

ARDUINO MEGA 2560 - ONLY IF YOU WANT TO MODIFY THE FIRMWARE (OPTIONAL)  
[HTTPS://WWW.ARDUINO.CC/EN/MAIN/SOFTWARE](https://www.arduino.cc/en/main/software)

REPETIER HOST 1.5.3

[HTTP://WWW.REPETIER.COM/DOWNLOAD/](http://www.repetier.com/download/)

DOWNLOAD THE ENTIRE MARLIN FIRMWARE FOLDER AND SLICER/CURA CONFIG FILES FOR YOUR REACH PRINTER:  
[BIT.DO/REACH3DPRINTER](http://bit.do/reach3dprinter)

I NOW RECOMMEND USING CURA. IT SEEMS TO DO A MUCH BETTER JOB. THERE ARE SOME SETUP VIDEOS AVAILABLE, BUT CONTINUE READING TO GET A FEEL FOR ALL THE STEPS.  
NEVER LEAVE YOUR PRINTER UNATTENDED.

PRINTER PROGRAM SETUP:

OPEN REPETIER HOST.

CLICK THE "CONNECT" BUTTON.

IF A POPUP SAYS "CONNECTION ERROR" AND ASKS TO OPEN PRINTER SETTINGS, CLICK YES AND CHOOSE THE APPROPRIATE COM# PORT THAT YOUR REACH PRINTER USB IS CONNECTED TO. CLICK OK, THEN TRY TO RECONNECT AGAIN.

ONCE CONNECTED, GO TO THE SLICER TAB ON THE RIGHT.

CLICK ON THE CONFIGURATION TAB.

IN THE SLICER CONFIGURATION, GO TO "FILE/LOAD CONFIG..." AND FIND THE REACH PRINTER CONFIG FILES PREVIOUSLY DOWNLOADED.

LOAD ALL .RCP AND .RCF FILES.

ALSO LOAD THE "REACH FILAMENT" CONFIG INTO THE FILAMENT SETTINGS TAB.

FINALLY LOAD THE "REACH PRINT SPEEDS" CONFIG INTO THE PRINT SETTINGS TAB. IF YOUR PLANNING TO PRINT ANY VASES, LOAD THE "REACH PRINT SPEEDS VASE MODE" CONFIG AS WELL.

SAVE ALL CONFIGURATIONS. AND CLOSE THE WINDOW. YOUR NOW DONE WITH ALL SOFTWARE CONFIGURATIONS!

RECOMMEND WIRING FAN TO CONSTANT 12V... FAN ALWAYS ON!!!

AFTER CONNECTING TO YOUR REACH PRINTER IN REPETIER HOST, YOU NEED TO FIND SOMETHING TO PRINT!

REPETIER READS .STL FILES. THESE ARE COMMON FILE TYPES USED FOR 3D OBJECTS.

I RECOMMEND JOINING [WWW.THINGIVERSE.COM](http://WWW.THINGIVERSE.COM) AND BROWSING THROUGH THE THOUSANDS OF COOL OBJECTS TO PRINT!

START WITH A CUBE, OR A TEST PRINT!

WHEN YOU FIND A COOL OBJECT, THERE WILL BE A DOWNLOAD ALL LINK.

DOWNLOAD THE FILES ONTO YOUR COMPUTER, IN A FOLDER YOU SPECIFY.

PLACING YOUR FILE

NOW, GO TO YOUR REPETIER HOST PROGRAM, AND CLICK THE OBJECT PLACEMENT TAB.

THEN CLICK THE PLUS SYMBOL, "ADD OBJECT".

FIND YOUR TEST CUBE, IN STL FORMAT, AND CLICK OPEN.

NEXT YOU WILL WANT TO POSITION THE OBJECT ON THE GRID. SOME WHERE IN THE MIDDLE.

IF YOUR OBJECT IS TOO BIG TO SEE A GRID, OR THE GRID IS HUGE AND THE OBJECT FITS ENTIRE INSIDE OF ONE SQUARE OF THE GRID, YOU MAY NEED TO CHANGE THE UNITS OF IMPORTED OBJECTS, IN THE CONFIG TAB AT THE TOP OF THE SCREEN, FROM INCHES TO MM OR VICE VERCA.

IF THIS HAPPENS, SIMPLY TRASH THE OBJECT FILE, ON THE FAR RIGHT, BY CLICKING THE TRASH CAN ICON.

THEN SIMPLY RE-UPLOAD THE FILE WITH THE NEW MM OR INCHES SETTING.

SLICING YOUR FILE

NEXT, GO TO THE SLICER TAB, AND SELECT THE APPROPRIATE CONFIGS IN THE SLICER TAB.

THEN CLICK THE SLICE BUTTON.

AFTER A FEW SECONDS TO A MINUTE, DEPENDING ON FILE SIZE AND COMPUTER SPEED, YOU WILL SEE A PREVIEW OF YOUR OBJECT.

READY TO PRINT

WITH THE HOT END NOZZLE, A CARD STOCK THICKNESS AWAY FROM THE PRINTBED, AND THE HOT END CARRIAGE ALL THE WAY TO THE LEFT, AND THE TABLE ALL THE WAY BACK, YOUR READY TO PRINT.

SIMPLY CLICK "START PRINT", AND WATCH THE MAGIC OF 3D PRINTING UNFOLD. AS THE TEMP RAISES, AND SETTLES AT TARGET TEMP OF 190c, THE PRINTER CAN FREEZE IF OTHER PROGRAMS ARE RUNNING, OR IF THE COMPUTER SERIAL CONNECTION FAULTS. WATCH THE TEMP, ENSURING THE FAN IS ON. IF THIS HAPPENS. DISCONNECT, OR KILL PRINT, THEN DISCONNECT, AND SAY "NO" TO DISABLE HEATERS, AND THEN RECONNECT. AGAIN, HOME THE Z AND HIT START.

NEVER LEAVE YOUR PRINTER UNATTENDED.

ENSURE ALL OTHER PROGRAMS ARE CLOSED. TUTORIALS ON YOUTUBE WILL BE AVAILABLE LATER ON AT:

[HTTPS://WWW.YOUTUBE.COM/CHANNEL/UCvBJNRz-D3svzVMT8cWYlW](https://www.youtube.com/channel/UCvBJNRz-D3svzVMT8cWYlW)

IF YOUR PRINT HAS AN ISSUE OR FREEZES, SIMPLY CLICK THE "KILL PRINT" BUTTON AT THE TOP, AND UNPLUG THE POWER AND USB CABLES. THEN TRY AGAIN. DEPENDING ON YOUR COMPUTERS VIDEO MEMORY, THE RAMPS MAY FREEZE AFTER INITIAL HEATUP. THIS CAN LEAVE THE RAMPS UNRESPONSIVE, WITH THE HEATER BLOCK STILL ON. ALWAYS WATCH YOUR PRINTER FOR THE FIRST LAYER.

CHECK REPRAP SUPPORT ONLINE BEFORE GIVING UP!

IF ALL ELSE FAILS, CONTACT THE TEAM AT REACH AND WE WILL TRY TO HELP STEER YOU IN THE RIGHT DIRECTION!

## HOT END CLOGGED?

1. CONNECT FAN DIRECTLY TO 12V CONSTANT
2. WITH FAN ON, SET MANUAL TEMP TO 150C
3. AT 150C, PULL FILAMENT OUT AS YOU MANUALLY REVERSE LASRGE GAER
4. IF FILAMENT IS REMOVABLE, FULLY REMOVE IT
5. IF NOT, RELEASE EXTRUDER TENSION ARM TO ALLOW FILAMENT TO MOVE
6. WITH FILAMENT ARM LOOSE, UNCOUPLE TEFLON TUBE AT HOT END AND EXTRUDER
7. WHILE STILL HOT, USE PLIERS TO REMOVE BRASS TUBE COUPLING FROM HOT END
8. CHECK FOR CLOG, ATTEMPT TO REMOVE FILAMENT WHILE STILL HOT
9. STILL STUCK? LOOSEN NOZZLE WITH PLIERS WHILE HOLDING HEAT BLOCK WITH PLIERS
10. TURN OFF HEAT. REMOVE HOT END CLAMP AND FAN
11. HOLD HEAT BLOCK WITH PLIERS AND UNSCREW ALUMINUM HEAT SINK
12. FULLY DISMANTLE HOT END TO FIND BLOCKAGE, INSIDE HEAT SINK.

## SOFTWARE FREEZE?

ENSURE NO OTHER PROGRAM IS BOGGING DOWN YOUR SYSTEM WHILE TRYING TO RUN REPETIER HOST. REPETIER HOST CAN USE A LOT OF VIDEO MEMORY. DISCONNECT USB AND POWER FROM PRINTER. DISCONNECT REPETIER AND RESTART REPETIER HOST.

IF YOU CONTINUE TO EXPERIENCE FREEZES, RESTART YOUR COMPUTER COMPLETELY.

## HOMING

LEVEL BED FIRST, THEN HOME. ADJUST CAM AND SWITCH POSITIONING.

## FIRST LAYER

SLOW FIRST LAYER DOWN. ENSURE TABLE IS LEVELED. IF NO PLASTIC IS EXTRUDING, ENSURE NOZZLE IS HIGH ENOUGH. IF PLASTIC WON'T STICK, CHECK BUILD SURFACE IS PREPARED PROPERLY.

## STEPPER SKIPPING

TIGHTEN BELTS, ENSURE MOTOR CABLES ARE PROPERLY CONNECTED, VIA WIRE COLORS, TO THE RAMPS BOARD.

## Z WOBBLE

ADJUST VERTICAL FRAME AND Z CLAMP POSITION. ADDING OR REMOVING WASHERS MAY BE NECESSARY TO POSITION Z NUT IN THE CENTER.

## HEAT UP

ENSURE PRINT STARTS. IT CAN FREEZE ON STARTUP. IF A FREEZE ON STARTUP OCCURS, REFER TO SOFTWARE FREEZE SECTION. HEATER MAY REMAIN ON UNTIL DISCONNECTED AND RECONNECTED TO REPETIER HOST. IF HEATUP WON'T START, ENSURE THERMISTOR IS CONNECTED CORRECTED AND TEMPS ARE SHOWING.

## USB DISCONNECT

IF COMMUNICATION ERRORS, TRY ANOTHER CABLE. ISSUE CAN ALSO ARISE FROM A SOFTWARE FREEZE. TRYING DISCONNECTING AND RECONNECTING. FOR LONG PRINTS ON A COMPUTER HAVING OCCASSIONAL ERRORS, USE THE LCD SD CARD READER. THIS WILL ENSURE THE COMPUTER IS NOT THE ISSUE. YOU CAN ALSO TRY SETTING YOUR COMPUTER TO NOT ENTER SLEEP MODE WHILE PRINTING.

## HOT END JAM

THE MOST COMMON ISSUE PEOPLE FACE IS A JAMMED HOT END. IF YOU EXPERIENCE A JAM, IT CAN BE FRUSTRATING, BUT IF YOU FOLLOW A FEW STEPS, AND KNOW WHY IT MAY BE HAPPENING, YOU MAY SOLVE IT IN A FEW MINUTES.

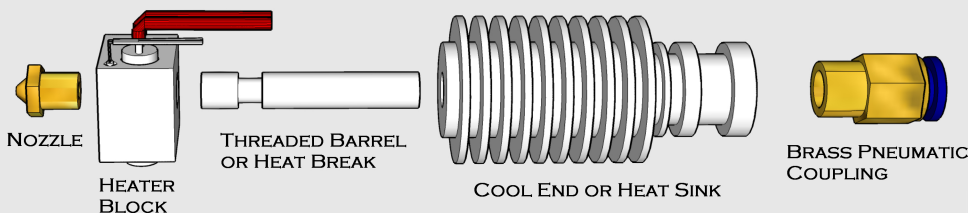
WITH A HOT HOTEND...

PULL THE FILAMENT OUT OF THE EXTRUDER, WHILE TURNING THE LARGE WHEEL COUNTER CLOCKWISE. IF IT COMES OUT OF THE HOT END EASILY, THAT'S GOOD. CHECK THE FILAMENT AND SEE IF THERE IS A CHUNK MISSING. DID THE Mk8 GEAR STRIP THE FILAMENT? CUT IT BEFORE THE MISSING CHUNK, THEN TRY RELOADING, AND PUSHING THE FILAMENT THROUGH. IF THERE IS RESISTANCE AT THE HOT END, YOU HAVE A CLOG.

IF IT DIDN'T REMOVE EASILY, IT MEANS YOU MAY BE USING THE WRONG THREADED BARREL.

A TEFLON LINED THREADED BARREL IS FOR PLA, THE ALL METAL IS FOR ABS.

IF USING CHEAP FILAMENT, YOU MAY HAVE A GLASS BEAD STUCK IN YOUR NOZZLE. USE A VERY THIN PEICE OF WIRE AND CLEAN THE HOT END FROM THE NOZZLE SIDE. SOMETIMES YOU CAN SIMPLY PUSH AND PULL FILAMENT, TO PLUNGE A CLOG. TRY A COLD PULL TO CLEAN DEBRIS. MAKE SURE YOUR FAN IS KEEPING THE COOL END, HEAT SINK COOL.



## PROXIMITY LEVELING

GETTING THE PROXIMITY SENSOR AT EXACTLY THE CORRECT HEIGHT CAN BE CHALLENGING.

IF THE SENSOR IS OFF, IT MAY CAUSE THE GANTRY TO LIFT OFF THE Z LEAD NUT, OR THE PRINT MAY NOT ACTUALLY BE STICKING TO THE SURFACE. A WELL CALIBRATED PROXIMITY SENSOR IS A JOY TO SEE PRINT PERFECTLY EVERY TIME!

## BELT RUBBING

OVER TIME, THE BEARINGS MAY WEAR, AND THEIR ACCURACY WILL DECREASE. THIS MAY CAUSE THE BELTS TO RUB UNDER THE TABLE. CURRENTLY, THIS IS SOMETHING A FEW OF OUR PRINTERS EXPERIENCE, BUT SHOULDN'T BE AN ISSUE, AS LONG AS THE BEARING GUIDES ARE TIGHTENED IN PLACE. YOU MAY SEE SOME BLACK BELT DUST COLLECTING ON THE TABLE SUPPORT. DONT WORRY, JUST REMOVE THE BED AND MAKE SURE THE BELT BEARING GUIDES DIDN'T COME LOOSE. OTHERWISE, THE BELTS ONLY LOOSE A LITTLE BIT OF MATERIALS ON THE EDGE, AND IT USUALLY STOPS SOON. SINCE THIS IS A MINOR ISSUE, AND DOESN'T AFFECT THE OPERATION OF THE PRINTER, WE WILL SIMPLY DESIGN A BELT GUIDE IN THE FUTURE, TO PREVENT THE UNSIGHTLY DUST!

## BED NUTS

WE HAVE NOTICED THAT SOME OF THE M3 NUTS THAT HOLD THE TABLE IN PLACE, HAVE A TENDENCY TO LOOSEN ON THEIR OWN. IN A WORSE CASE SCENARIO, IF YOU LEAVE WHILE THE PRINTER IS RUNNING, WHICH YOU SHOULD NEVER DO, AND 2 OR MORE M3 NUTS FALL OFF, THE TABLE WILL GO SKEWED, YOUR PRINT WILL STICK TO THE HOT END, AND THERE WILL BE A MASSIVE BALL OF PLASTIC, POSSIBLY PUSHING AROUND ON YOUR RAMPS BOARD! THIS IS BAD.

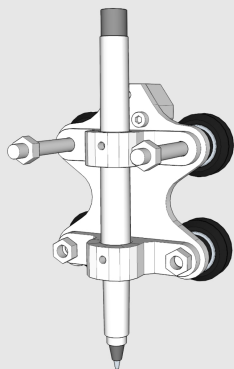
YOU CAN USE A SPOT OF GLUE ON THE M3x16 BOLTS AND NUTS, THAT HOLD THE TABLE TO THE L RAILS, OR YOU CAN SHIM THE SPRINGS HIGHER, SO THAT THERE IS MORE TENSION ON THE NUTS, YOU CAN FLIP THE BOLTS AND NUTS UPSIDE DOWN, SO YOU CAN SEE IF THEY ARE STARTING TO UNTHREAD, OR YOU CAN PRINT SOME BASIC M3 NUTS, WITH A 2.8MM HOLE, SO THE BOLTS ARE SNUG!

## USB CONNECTION TO COMPUTER

WHEN PRINTING, TETHERED TO YOUR COMPUTER WITH A USB CABLE, YOUR COMPUTER MAY HAVE COM PORT CONFLICTS. YOUR COMPUTER ALSO MAY NOT HAVE ENOUGH POWER TO FEED A STEADY STREAM OF DATA TO THE RAMPS BOARD. THE USB CABLE MAY EVEN BE WEARING OUT, CAUSING YOUR 3D PRINTER TO MOMENTARILY DISCONNECT, CAUSING YOUR PRINT TO FAIL.

TRY SWITCHING USB PORTS, USB CABLES, CLOSING OTHER PROGRAMS. IF NOTHING SEEMS TO BE WORKING, SIMPLY BUY AN LCD SCREEN AND PRINT FROM AN SD CARD. THE COMPATIBLE LCD SCREEN IS: LCD 12864. THEY USUALLY COST ABOUT \$10-15 AND ARE WORTH MORE!

THE REACH 3D PRINTER IS DESIGNED TO BE A HIGHLY VERSATILE MACHINE. WE ARE WORKING ON QUICK CHANGE CLAMPS, EXTENDING THE BUILD VOLUME, AND MAKING A DUAL EXTRUDER SETUP. WE ALSO PLAN TO IMPLEMENT A PASTE EXTRUDER IN THE NEAR FUTURE. KEEP AN EYE ON OUR G+ COMMUNITY FOR UPDATES, AND OUR THINGIVERSE PAGE FOR CAD MODELS.

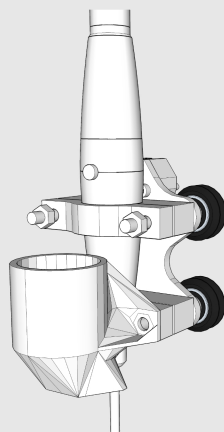


### PLOTTER MOD

THE PLOTTER OR DRAGKNIFE TOOL CAN PLOT IMAGES ON PAPER OR CUT VINYL. SIMPLY PRINT THE CLAMPS AND CLAMP A SHARPIE IN PLACE. THIS TOOL USES INKSCAPE AND A BUILT IN GCODE EXTENSION TO GENERATE THE GCODE, THAT IS THEN RAN THROUGH REPETIER HOST.

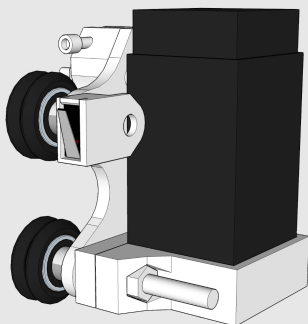
### CNC MILL MOD

THE CNC MILL IS DESIGNED TO SLOWLY CUT SOFT WOOD AND LIGHTER MATERIALS LIKE FOAM AND CIRCUIT BOARD. WE RECOMMEND A HIGH QUALITY, STOUT ENDMILL, AND MILLING AT VERY SLOW TRAVEL SPEEDS, AROUND 7-15 MM/S. WE ARE CURRENTLY USING INKSCAPE'S GCODE TOOLS FOR 2D MILLING, AND VISUAL CAD WITH FREE MILL PLUGIN TO MILL IN 3D.



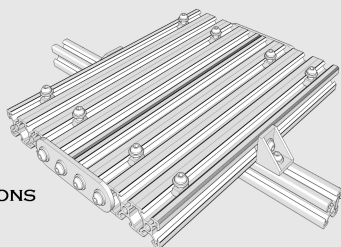
### LASER MOD

CURRENTLY, WE DO NOT RECOMMEND ATTEMPTING THE LASER ENGRAVER OR LASER CUTTER MOD. IT IS AGAINST FDA REGULATION TO OPERATE A LASER MODULE, WITHOUT THE REQUIRED SAFETY FEATURES. THE SAFETY FEATURES INCLUDE: A KEYED POWER SUPPLY, SAFETY INTERLOCKS, A FULLY ENCLOSED CASE, LED INDICATORS, VENTILATION, A POWER SWITCH, AND US TESTING TO ENSURE THEY CONFORM TO EMISSION STANDARDS, AMONG MANY OTHER REGULATIONS. IT IS A VIOLATION OF FEDERAL LAW TO OPERATE THESE LASERS WITHOUT MEETING THESE GUIDELINES, SO WE HIGHLY RECOMMEND AGAINST THIS MODIFICATION. TO MEET SAFETY STANDARDS IN THE US, PLEASE CHECK OUT [WWW.JTECHPHOTONICS.COM](http://WWW.JTECHPHOTONICS.COM) FOR COMPLIANT LASER SYSTEMS.



### CNC TABLE MOD

ONE OF OUR MOST RECENT MODIFICATIONS HAS BEEN THE ADDITION OF A CNC TABLE CAPABLE OF CLAMPING YOUR WORK PIECE DOWN. THE CLAMPS ARE ADJUSTABLE AND WILL BE AVAILABLE FOR PURCHASE ON THE REACH WEBSITE SOON. CHECK BACK REGULARLY FOR THE NEWEST MODIFICATIONS





THANK YOU FOR YOUR SUPPORT OF THE REACH 3D PRINTER PROJECT. OUR MISSION IS TO PROVIDE QUALITY PRODUCTS FOR THE 3D PRINTING ENTHUSIAST AND DIY'ER. WE STRIVE TO PROVIDE A HIGHLY ADAPTABLE DESIGN TO FURTHER MODIFY THESE 3D PRINTERS INTO MULTI-FUNCTION MACHINES WITH ENDLESS POSSIBILITIES.

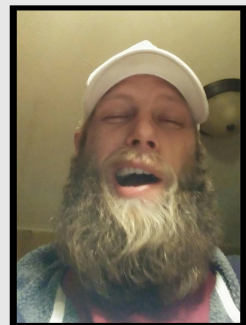
WE ALSO HOPE TO PROVIDE AN EXCELLENT VALUE FOR AN ENTRY-LEVEL 3D PRINTER THAT IS SO VERSATILE AND SIMPLE THAT IT HAS THE ABILITY TO APPEAL TO ANYONE.

IF YOU HAVE ANY COMMENTS, QUESTIONS, CONCERNS, OR IDEAS TO IMPROVE THE REACH 3D PRINTER, FEEL FREE TO CONTACT THE REACH TEAM. WE ASPIRE TO GROW AND EXPAND OUR REACH WITH YOUR HELP!

CREATIVELY YOURS,  
THE TEAM AT REACH



KEITH



JOHN



NATE



MATT



WESTON

WRITTEN AND ASSEMBLED BY THE REACH TEAM.  
FOR MORE INFORMATION, GO TO [WWW.REACH3DPRINTERS.COM](http://WWW.REACH3DPRINTERS.COM)  
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